

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of claims:

1. (Original) A pharmaceutical composition comprising a molecule comprising a fucose group in an  $\alpha$ 1,2 linkage, an  $\alpha$ 1,3 linkage or an  $\alpha$ 1,4 linkage to a galactose group and a pharmaceutically acceptable carrier.
2. (Currently Amended) The composition of claim 1 where in the fucose is contained within an LNF-I group, an 2'FL group, an LNF-I group, ~~an LNF-II group, an 3'FL group, an LNF-III group,~~ an LDFH-I group, a LDFT group or a variant thereof in which the Glc at the reducing end is replaced with GlcNAc.
3. (Previously Presented) The composition of claim 1 wherein the molecule is a glycan, a glycolipid, a glycoprotein, a glycosaminoglycan or a mucin.
4. (Currently Amended) The composition of claim 1 wherein the molecule comprises at least two different groups selected from an LNF-I group, an 2'FL group, an LNF-I group, ~~an LNF-II group, an 3'FL group, an LNF-III group,~~ an LDFH-I group, a LDFT group or a variant thereof in which the Glc at the reducing end is replaced with GlcNAc.
- 5-6. (Canceled)
7. (Previously Presented) The composition of claim 1 wherein the groups are covalently linked to a protein in an O-link to Ser or Thr or an N-link to Asn.
8. (Previously Presented) The composition of claim 1 wherein the composition does not contain a mammalian milk.

9. (Canceled)

10. (Original) A pharmaceutical composition comprising a purified protein modified to include at least two different groups selected from:

2'-Fucosyllactose;  
Lacto-N-fucopentaose I;  
Lacto-N-fucopentaose II;  
3'-Fucosyllactose;  
Lacto-N-fucopentaose II;  
Lacto-N-difucohexaose I;  
Lactodifucotetraose;  
LactoN-tetraose;  
LactoN-neotetraose;  
3'-Sialyllactose;  
3'-Sialyllactosamine;  
6'-Sialyllactose;  
6'-Sialyllactosamine;  
Sialyllacto-N-neotetraose c;  
Monosialyllacto-N-hexaose;  
Disialyllacto-N-hexaose I;  
Monosialyllacto-N-neohexaose I;  
Monosialyllacto-N-neohexaose II  
Disialyllacto-N-neohexaose  
Disialyllacto-N-tetraose;  
Disialyllacto -N-hexaose II;  
Sialyllacto-N-tetraose a;  
Disialyllacto-N-hexaose I;  
Sialyllacto-N-tetraose b;  
3'-Sialyl-3-fucosyllactose;  
Disialomonofucosyllacto-N-neohexaose;

Monofucosylmonosialyllacto-N-octaose (sialyl Lea);  
Sialyllacto-N-fucohexaose II;  
Disialyllacto-N-fucopentaose II;  
Monofucosyldisialyllacto-N-tetraose, or a variant thereof wherein Glc at the reducing end is replaced with GlcNAc.

11-14. (Canceled)

15. (Previously Presented) The composition of claim 1 which is a synthetic composition.

16-19. (Canceled)

20. (Original) A pharmaceutical composition comprising a purified protein modified to include at least two different groups selected from:

2'-Fucosyllactose;  
Lacto-N-fucopentaose I;  
Lacto-N-fucopentaose II;  
3'-Fucosyllactose;  
Lacto-N-fucopentaose II;  
Lacto-N-difucohexaose I;  
Lactodifucotetraose;  
2'-FLNac, or a variant thereof in which the Glc at the reducing end is replaced with GlcNAc;  
wherein the protein is not modified to contain any other oligosaccharides.

21. (Original) A synthetic nutritional composition comprising a glycan, a glycolipid, a glycoprotein, a glycosaminoglycan or a mucin that comprises at least two different groups selected from an LNF-I group, and 2'FL group, an LDFH-I group and a LDFT group or a variant thereof in which the Glc at the reducing end is replaced with GlcNAc.

22-27. (Canceled)

28. (Previously Presented) A synthetic nutritional composition comprising a purified protein modified to include a group selected from: a Lacto-N-fucopentaose I group, a Lacto-N-fucopentaose II group, a 2-Fucosyllactose group, a 3-Fucosyllactose group, a Lacto-N-fucopentaose II group, a Lacto-N-difucohexaose I group, and a Lactodifucotetraose group or a variant thereof in which the Glc at the reducing end is replaced with GlcNAc.

29-32. (Canceled)

33. (Previously Presented) A method for treating or reducing the risk of infection, the method comprising administering the composition of claim 1 wherein said composition is not a mammalian milk.

34. (Original) The method of claim 33 wherein the composition comprises 2'FL or 2'FLNAC.

35. (Original) The method of claim 34 wherein the molecule comprises a protein to which 2'FL and/or 2'FLNAC are directly or indirectly covalently attached.

36. (Original) The method of claim 33 wherein the infection is caused by *V. cholerea* or *C. jejuni*.

37. (Original) The method of claim 33 wherein the infection is an enteric infection.

38. (Original) A method for reducing the risk of enteric disease in a patient, the method comprising,

- (a) identifying the two most prevalent agents capable of causing enteric disease in the geographic location of the patient;
- (b) administering to the patient a composition comprising a molecule comprising a first glycan which interferes with the binding to epithelial cells of the first of the two most prevalent agents and a second glycan which interferes with the binding to epithelial cells of the second of the two most prevalent agents wherein said composition is not breast milk.

39. (Original) A method for reducing the risk of enteric disease in a patient, the method comprising,

- (a) identifying the two most prevalent agents capable of causing enteric disease in the geographic location of the patient;
  - (b) administering to the patient composition comprising
    - i) a first molecule comprising a first glycan which interferes with the binding to epithelial cells of the first of the two most prevalent agents; and
    - ii) a second molecule glycan which interferes with the binding to epithelial cells of the second of the two most prevalent agents;
- wherein said composition is not breast milk.

40. (Original) A yeast cell harboring a recombinant vector comprising a nucleotide sequence encoding GDP-mannose 4, 6 dehydratase and a nucleotide sequence encoding GDP-L-fucose synthetase.

41. (Original) The yeast cell of claim 40 wherein the GDP-mannose 4, 6 dehydratase is *H. pylori* GDP-mannose 4, 6 dehydratase.

42. (Previously Presented) The yeast cell of claim 40 wherein the GDP-L-fucose synthetase is *H. pylori* GDP-L-fucose synthetase.

43. (Previously Presented) The yeast cell of claim 40 wherein the yeast cell harbors a nucleic acid molecule encoding a GDP-fucose/GMP antiporter fusion protein.

44. (Previously Presented) The yeast cell of claim 43 wherein the fusion protein comprises a golgi-membrane location sequence.

45. (Original) The yeast cell of claim 43 wherein the golgi-membrane location sequence is from Vrg4p.

46. (Original) An isolated nucleic acid molecule encoding a fusion protein comprising at least a first portion and a second portion, the first portion comprising the active domain of a GDP-fucose/GMP antiporter and the second portion comprising a golgi localization sequence.

47. (Canceled)

48. (Original) A yeast harboring the isolated nucleic acid molecule of claim 46.

49. (Original) The yeast of claim 48 further harboring a nucleic acid molecule encoding a fucosyltransferase or a galactosyltransferase.

50. (Original) The yeast of claim 49 wherein the fucosyltransferase is selected from:

Homo sapiens fucosyltransferase 1 (galactoside 2-alpha-L-fucosyltransferase, Bombay phenotype included) (FUT1);

Homo sapiens fucosyltransferase 2 (secretor status included) (FUT2);

Homo sapiens fucosyltransferase 3 (galactoside 3(4)-L-fucosyltransferase, Lewis blood group included) (FUT3);

Homo sapiens fucosyltransferase 4 (alpha (1,3) fucosyltransferase, myeloid-specific) (FUT4);

Homo sapiens fucosyltransferase 5 (alpha (1,3) fucosyltransferase) (FUT5);

Homo sapiens fucosyltransferase 6 (alpha (1,3) fucosyltransferase) (FUT6);

Homo sapiens fucosyltransferase 7 (alpha (1,3) fucosyltransferase) (FUT7);

Homo sapiens fucosyltransferase 8 (alpha (1,6) fucosyltransferase) (FUT8);

Homo sapiens fucosyltransferase 9 (alpha (1,3) fucosyltransferase) (FUT9); and

Homo sapiens protein o-fucosyltransferase (POFUT1).

51. (Canceled)

52. (New) A pharmaceutical composition comprising an oligosaccharide or a glycoconjugate containing the oligosaccharide, the oligosaccharide including a fucose group in an  $\alpha$ 1,4 linkage to an *N*-acetylglucosamine group, a fucose group in an  $\alpha$  1,3 linkage to an *N*-acetylglucosamine group, or a fucose group in an  $\alpha$  1,3 linkage to a glucose group and a pharmaceutically acceptable carrier.

53. (New) The composition of claim 52, wherein the oligosaccharide is LNF-II, 3'FL, LNF-III, or a variant thereof, the variant being identical to LNF-II, 3'FL, or LNF-III except that its reducing end is an *N*-acetylglucosamine instead of a glucose.

54 (New) The composition of claim 52, wherein the glycoconjugate further contains another oligosaccharide selected from the group consisting of LNF-II, 3'FL, LNF-III, and a variant thereof, the variant being identical to LNF-II, 3'FL, or LNF-III except that its reducing end is an *N*-acetylglucosamine instead of a glucose.

55 (New) The composition of claim 52, wherein the glycoconjugate is a glycan, a glycolipid, or a glycoprotein.

56. (New) The composition of claim 55, wherein the glycan is a glycosaminoglycan

57. (New) The composition of claim 55, wherein the glycoprotein is a mucin.